

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims 1-43 (canceled).

Claim 44. (Withdrawn – Currently Amended): A nucleic acid molecule ~~comprising a nucleic acid sequence~~ which encodes a polypeptide selected from any one of:

- (a) SEQ ID No: 2; and
- (b) an immunogenic fragment comprising at least 20 consecutive amino acids from ~~a polypeptide of (a); and~~ SEQ ID NO:2.
- (c) ~~a polypeptide of (a) or (b) which has been modified without loss of immunogenicity, wherein said modified polypeptide is at least 80% identical in amino acid sequence to the corresponding polypeptide of (a) or (b).~~

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Claim 45. (Currently amended): A An isolated nucleic acid molecule comprising a ~~nucleic acid sequence selected from any one of:~~

- (a) SEQ ID No: 1; or
- (b) a sequence ~~which encodes a polypeptide encoded by SEQ ID No: 1;~~ encoding SEQ ID NO:2.
- (c) ~~a sequence comprising at least 60 consecutive nucleotides from any one of the nucleic acid sequences of (a) and (b); and~~
- (d) ~~a sequence which encodes a polypeptide which is at least 80% identical in amino acid sequence to the polypeptide encoded by SEQ ID No: 1.~~

Claim 46. (Withdrawn – Currently Amended): A An isolated nucleic acid molecule ~~comprising a nucleic acid sequence~~ which is anti-sense to the nucleic acid molecule of claim 44.

Claim 47. (Withdrawn – Currently Amended): ~~A~~ An isolated nucleic acid molecule ~~comprising a nucleic acid sequence~~ which encodes a fusion protein, said fusion protein comprising a polypeptide encoded by ~~a~~ the nucleic acid molecule according to claim 44 and a second polypeptide.

Claim 48. (Withdrawn): The nucleic acid molecule of claim 47 wherein the second polypeptide is a heterologous signal peptide.

Claim 49. (Withdrawn): The nucleic acid molecule of claim 47 wherein the second polypeptide has adjuvant activity.

Claim 50. (Withdrawn – Currently Amended): ~~A~~ The nucleic acid molecule according to claim 44, operatively linked to one or more expression control sequences.

Claim 51. (Currently amended): A vaccine comprising a vaccine vector ~~and at least one first~~ wherein the vaccine vector comprises a polypeptide-encoding nucleic acid sequence selected from any one of:

(i) SEQ ID No: 1;

(ii) a nucleic acid sequence which encodes ~~a polypeptide encoded by SEQ ID No: 1;~~ SEQ ID NO:2; and

~~(iii) a nucleic acid sequence comprising at least 38 consecutive nucleotides from any one of the nucleic acid sequences of (i) and (ii);~~

~~(iv) a nucleic acid sequence which encodes a polypeptide which is at least 75% identical in amino acid sequence to the polypeptide encoded by SEQ ID No: 1;~~

~~(v) a nucleic acid sequence which encodes a polypeptide whose sequence is set forth in SEQ ID No: 2;~~

~~(vi)~~ (iii) a nucleic acid sequence which encodes an immunogenic fragment comprising at least 12 consecutive amino acids from SEQ ID No:2; ~~and~~

~~(vii) a nucleic acid sequence which encodes a polypeptide as defined in (i) to (v) or an immunogenic fragment as defined in (vi) which has been modified without loss of immunogenicity, wherein said modified polypeptide or fragment is at least 75% identical in amino acid sequence to the corresponding polypeptide of (i) to (v) or the corresponding fragment of (vi);~~

wherein ~~each first~~ the nucleic acid is capable of being expressed.

Claim 52. (Currently amended): A vaccine comprising a vaccine vector ~~and at least one first~~ wherein the vaccine vector comprises a nucleic acid encoding a fusion protein, wherein the fusion protein comprises:

(a) a first polypeptide selected from any one of:

(i) a polypeptide encoded by SEQ ID No: 1;

(ii) a polypeptide encoded by a nucleic acid sequence comprising at least 38 consecutive nucleotides from SEQ ID No: 1 in the reading frame set forth in SEQ ID NO:2;

~~(iii) a polypeptide which is at least 75% identical in amino acid sequence to the polypeptide encoded by SEQ ID No: 1;~~

~~(iv)~~ (iii) a polypeptide whose sequence is set forth in SEQ ID No: 2;

and

~~(v)~~ (iv) an immunogenic fragment comprising at least 12 consecutive amino acids from SEQ ID No:2; and

~~(vi) a polypeptide as defined in (i) to (iv) or an immunogenic fragment as defined in (v) which has been modified without loss of immunogenicity, wherein said modified polypeptide or fragment is at least 75% identical in amino acid sequence to the corresponding polypeptide of (i) to (iv) or the corresponding fragment of (v); and~~

(b) a second polypeptide;

wherein ~~each first~~ the nucleic acid encoding the fusion protein is capable of being expressed.

Claim 53. (Previously presented): The vaccine of claim 52 wherein the second polypeptide is a heterologous signal peptide.

Claim 54. (Previously presented): The vaccine of claim 52 wherein the second polypeptide has adjuvant activity.

Claim 55. (Previously presented): The vaccine of claim 51 wherein each first nucleic acid is operatively linked to one or more expression control sequences.

Claim 56. (Currently amended): ~~A~~ The vaccine according to claim 51 wherein each first nucleic acid is expressed as a polypeptide the polypeptide-encoding nucleic acid is the first nucleic acid, and wherein the vaccine further comprises a second nucleic acid encoding an additional polypeptide which enhances the immune response to the polypeptide expressed by said first nucleic acid.

Claim 57. (Currently amended): The vaccine of claim 56 wherein the ~~second nucleic acid encodes an~~ additional polypeptide is a Chlamydia polypeptide.

Claim 58. (Currently amended): A pharmaceutical composition comprising a the nucleic acid according to claim ~~[[44]]~~ 45 and a pharmaceutically acceptable carrier.

Claim 59. (Currently amended): A pharmaceutical composition comprising ~~a vaccine according to claim 51 and~~ a pharmaceutically acceptable carrier or diluent suitable for use in a vaccine, and a polypeptide-encoding nucleic acid molecule selected from any one of:

(i) SEQ ID No: 1;

(ii) a nucleic acid sequence which encodes SEQ ID NO:2; and

(iii) a nucleic acid sequence which encodes an immunogenic fragment comprising at least 12 consecutive amino acids from SEQ ID No:2;

wherein the nucleic acid is capable of being expressed.

Claim 60. (Previously presented): A unicellular host transformed with the nucleic acid molecule of claim 50.

Claim 61. (Currently amended): ~~A~~ An isolated and purified nucleic acid probe of 5 to 100 consecutive nucleotides ~~which is at least 75% similar to the nucleic acid molecule~~ of SEQ ID No: 1, or ~~to~~ of a complementary ~~or anti-sense~~ sequence ~~of said nucleic acid molecule~~ of SEQ ID No: 1.

Claim 62. (Currently amended): ~~A~~ An isolated and purified primer of 10 to 40 consecutive nucleotides ~~which is at least 75% similar to the nucleic acid molecule~~ of SEQ ID No: 1, or ~~to~~ of a complementary ~~or anti-sense~~ sequence ~~of said nucleic acid molecule~~ of SEQ ID No: 1.

Claim 63. (Withdrawn – Currently Amended): A polypeptide encoded by a the nucleic acid sequence according to claim 45 in the reading frame set forth in SEQ ID NO:2.

Claim 64. (Withdrawn – Currently Amended): A polypeptide comprising an amino acid sequence selected from any one of:

(a) SEQ ID No: 2;

(b) an immunogenic fragment comprising at least 20 consecutive amino acids from ~~a polypeptide of (a); and~~ SEQ ID NO:2.

~~(c) a polypeptide of (a) or (b) which has been modified without loss of immunogenicity, wherein said modified polypeptide is at least 80% identical in amino acid sequence to the corresponding polypeptide of (a) or (b).~~

Claim 65. (Withdrawn – Currently Amended): A fusion protein comprising a the polypeptide of claim 63 and a second polypeptide.

Claim 66. (Withdrawn): The fusion protein of claim 65 wherein the second polypeptide is a heterologous signal peptide.

Claim 67. (Withdrawn): The fusion protein of claim 65 wherein the second polypeptide has adjuvant activity.

Claim 68. (Withdrawn – Currently Amended): A method for producing a the polypeptide of claim 63, comprising the step of culturing a unicellular host transformed with a nucleic acid encoding a the polypeptide of claim 63.

Claim 69. (Withdrawn): An antibody against the polypeptide of claim 63.

Claim 70. (Withdrawn – Currently Amended): A vaccine comprising at least one first polypeptide selected from any one of:

~~(i) a polypeptide encoded by SEQ ID No: 1;~~

~~(ii) a polypeptide encoded by a nucleic acid sequence comprising at least 38 consecutive nucleotides from SEQ ID No: 1;~~

~~(iii) a polypeptide which is at least 75% identical in amino acid sequence to the polypeptide encoded by SEQ ID No: 1;~~

~~(iv)~~ (i) a polypeptide whose sequence is set forth in SEQ ID No: 2; and

~~(v)~~ (ii) an immunogenic fragment comprising at least 12 consecutive amino acids from SEQ ID No:2; and

~~(vi) a polypeptide as defined in (i) to (iv) or an immunogenic fragment as defined in (v) which has been modified without loss of immunogenicity, wherein said modified polypeptide or fragment is at least 75% identical in amino acid sequence to the corresponding polypeptide of (i) to (iv) or the corresponding fragment of (v).~~

Claim 71. (Withdrawn – Currently Amended): A vaccine comprising at least one a fusion protein, wherein the fusion protein comprises:

(a) a first polypeptide selected from any one of:

~~(i) a polypeptide encoded by SEQ ID No: 1;~~

~~(ii) a polypeptide encoded by a nucleic acid sequence comprising at least 38 consecutive nucleotides from SEQ ID No: 1;~~

~~(iii) a polypeptide which is at least 75% identical in amino acid sequence to the polypeptide encoded by SEQ ID No: 1;~~

~~(iv) (i) a polypeptide whose sequence is set forth in SEQ ID No: 2; and~~

~~(v) (ii) an immunogenic fragment comprising at least 12 consecutive amino acids from SEQ ID No:2; and~~

~~(vi) a polypeptide as defined in (i) to (iv) or an immunogenic fragment as defined in (v) which has been modified without loss of immunogenicity, wherein said modified polypeptide or fragment is at least 75% identical in amino acid sequence to the corresponding polypeptide of (i) to (iv) or the corresponding fragment of (v); and~~

(b) a second polypeptide.

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Claim 72. (Withdrawn): The vaccine of claim 71 wherein the second polypeptide is a heterologous signal peptide.

Claim 73. (Withdrawn): The vaccine of claim 71 wherein the second polypeptide has adjuvant activity.

Claim 74. (Withdrawn – Currently Amended): A vaccine comprising ~~at least one first~~ the polypeptide according to claim 63 and an additional polypeptide which enhances the immune response to the first polypeptide.

Claim 75. (Withdrawn): The vaccine according to claim 74 wherein the additional polypeptide comprises a *Chlamydia* polypeptide.

Claim 76. (Withdrawn – Currently Amended): A pharmaceutical composition comprising a the polypeptide according to claim 63 and a pharmaceutically acceptable carrier.

Claim 77. (Withdrawn – Currently Amended): A pharmaceutical composition comprising ~~a vaccine according to claim 70 and~~ a pharmaceutically acceptable carrier or diluent suitable for use in a vaccine, and a fusion protein comprising:

(a) a first polypeptide selected from any one of:


(i) a polypeptide whose sequence is set forth in SEQ ID No: 2; and

(ii) an immunogenic fragment comprising at least 12 consecutive amino acids from SEQ ID No:2; and

(b) a second polypeptide.

Claim 78. (Withdrawn – Currently Amended): A pharmaceutical composition comprising ~~an~~ the antibody according to claim 69 and a pharmaceutically acceptable carrier.

Claim 79. (Currently amended): A method for preventing or treating *Chlamydia* infection comprising administering to a patient an effective amount of:

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- (a) ~~a~~ the nucleic acid according to claim 45;
 - (b) a vaccine comprising a vaccine vector ~~and a~~ wherein the vaccine vector comprises the nucleic acid according to claim 45;
 - (c) a pharmaceutical composition comprising ~~a~~ the nucleic acid according to claim 45 and a pharmaceutically acceptable carrier;
 - (d) a polypeptide encoded by ~~a~~ the nucleic acid according to claim 45 in the reading frame set forth in SEQ ID NO:2; or
 - (e) an antibody against ~~a~~ the polypeptide ~~encoded by a nucleic acid according to claim 45 of (d).~~

Claim 80. (Withdrawn – Currently Amended): A method of detecting *Chlamydia* infection comprising the step of contacting a body fluid of a mammal to be tested, with a component selected from any one of:

- ~~(a)~~ a the nucleic acid according to claim 45;
- (b) a polypeptide encoded by ~~a~~ the nucleic acid according to claim 45 in the reading frame set forth in SEQ ID NO:2; and
- (c) an antibody against a polypeptide encoded by ~~a~~ the nucleic acid ~~according to claim 45 of (b).~~

Claim 81. (Withdrawn – Currently Amended): A diagnostic kit comprising instructions for use and a component selected from any one of:

- (a) a the nucleic acid according to claim 45;
- (b) a polypeptide encoded by a the nucleic acid according to claim 45 in the reading frame set forth in SEQ ID NO:2; and
- (c) an antibody against a polypeptide encoded by a the nucleic acid ~~according to claim 45~~ of (b).

Claim 82. (Withdrawn – Currently Amended): A method for identifying a the polypeptide of claim 63 which induces an immune response effective to prevent or lessen the severity of *Chlamydia* infection in a mammal previously immunized with polypeptide, comprising the steps of:

- (a) immunizing a mouse with the polypeptide of claim 63; and
- (b) inoculating the immunized mouse with *Chlamydia*;

wherein the polypeptide which prevents or lessens the severity of *Chlamydia* infection in the immunized mouse compared to a non-immunized control mouse is identified.

Claim 83. (Currently amended – Currently Amended): ~~A nucleic acid~~ The vaccine according to claim ~~50 which~~ 51 wherein the vaccine vector is expression plasmid pCAI764 as shown in Figure 3.

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Claim 84. (Withdrawn – Currently Amended): An isolated ATP/ADP translocase encoded by a the nucleic acid according to claim 44, wherein the translocase is from a *Chlamydia* species other than *Chlamydia trachomatis*.

Claim 85. (Withdrawn): An isolated ATP/ADP translocase according to claim 84 which is from *Chlamydia pneumoniae*.

Claim 86. (New): An isolated nucleic acid molecule comprising at least 60 consecutive nucleotides from:

- (a) SEQ ID No: 1; or
- (b) a sequence encoding SEQ ID NO:2.

Claim 87. (New): A vaccine comprising a vaccine vector wherein the vaccine vector comprises a polypeptide-encoding nucleic acid sequence comprising at least 38 consecutive nucleotides from:

(a) SEQ ID No: 1; or

(b) a nucleic acid sequence which encodes SEQ ID No: 2;

wherein the nucleic acid is capable of being expressed.